

# Carbon Monoxide (CO)

Carbon monoxide is a colorless, odorless, tasteless gas. Carbon monoxide is a poisonous gas comprised of one carbon and one oxygen atom. Carbon monoxide is frequently known by its formula CO.

## **Where does it come from?**

Carbon monoxide is produced by incomplete burning of fuels; natural gas used in appliances, furnaces, water heater, boilers, and vehicles. Any combustion process (burning) can result in the production of carbon monoxide. Typical sources of carbon monoxide in buildings are improperly vented furnaces and hot water heaters or exhaust fumes (from vehicles or furnaces) that have been drawn back into the building. Additional sources of carbon monoxide could include un-vented kerosene and gas space heaters; leaking chimneys and furnaces; back-drafting from furnaces, gas water heaters, wood stoves, and fireplaces; gas stoves; generators and other gasoline powered equipment; automobile exhaust from attached garages; and tobacco smoke. Incomplete oxidation during combustion in gas ranges and un-vented gas or kerosene heaters may cause high concentrations of CO in indoor air. Worn or poorly adjusted and maintained combustion devices (e.g., boilers, furnaces) can be significant sources, or if the flue is improperly sized, blocked, disconnected, or is leaking. Auto, truck, or bus exhaust from attached garages, nearby roads, or parking areas can also be a source.

## **Why measure carbon monoxide?**

Carbon monoxide is a poisonous gas that will cause illness and even death in high concentrations. Carbon monoxide poisoning can cause flu- like symptoms and also dizziness, fatigue, headaches, nausea, and irregular breathing. Higher doses or prolonged exposure of carbon monoxide can cause death without warning.

## **How do I measure carbon monoxide?**

There are a variety of meters for measuring carbon monoxide. You can Google “carbon monoxide meters” for a selection of meters. Pick a meter based on your needs and budget. You should also consider collecting long term data using a data logger device and recording carbon monoxide over extended periods (1 week). A single reading can give a false sense of security. Various events can create problems such as back-drafting, which may not be detected with a single sampling event.

We would also recommend carbon monoxide alarms in every home. The US Consumer Product Safety Commission recommends carbon monoxide alarms that meet the requirements of ANSI/UL 2034-02.

**What are normal levels that I might find?**

Average levels in homes without gas stoves vary from 0.5 to 5 parts per million (ppm). Levels near properly adjusted gas stoves are often 5 to 15 ppm and those near poorly adjusted gas stoves may be 30 ppm or higher.

**What standards are there for carbon monoxide ?**

No standards for CO have been agreed upon for indoor air. The U.S. National Ambient Air Quality Standards for outdoor air are 9 ppm for 8 hours, and 35 ppm for 1 hour.

The Occupational Safety and Health Administration (OSHA) established a Permissible Exposure Limits of 50 parts per million (ppm). OSHA standards prohibit worker exposure to more than 50 parts of the gas per million parts of air averaged during an 8-hour time period.

Symptoms of mild poisoning include headaches and dizziness at concentrations less than 100 ppm. As a result, prolonged exposures of this level can be life-threatening.